THURSDAY, DECEMBER 9, 1886

## COMPARATIVE ANATOMY OF VERTEBRATES

*Elements of Comparative Anatomy of Vertebrates.* Adapted from the German of Robert Wiedersheim, by W. Newton Parker. (London: Macmillan and Co., 1886.)

IN examinations for the higher degrees and diplomas in science and medicine, candidates are required to show that they possess not only a knowledge of the anatomy of the chief types of the animal kingdom, but also of comparative morphology. Indeed, with respect to medicine, this latter is the more important, especially the morphology of vertebrates. For some time past English students have found themselves considerably handicapped by the want of a short and concise text-book on this subject, to enable them to meet the requirements of Examination Boards; the text-books available for their perusal being generally of too advanced a character, and better suited for the use of those wishing to make comparative anatomy a lifelong study, than for students whose ulterior aim is the practice of medicine or some of its branches. German students, notwithstanding the numerous works on comparative anatomy published in that country, seem to have been equally as ill off for a suitable text-book as their English *confrères*. So impressed was Prof. Wiedersheim that his "Lehrbuch der Vergleichenden Anatomie," a work well known and appreciated by comparative anatomists in this country, and one of the leading works on the subject in Germany, was not a suitable book for ordinary students of medicine, that before bringing out a new edition of it he published a smaller one, entitled "Grundriss der Vergleichenden Anatomie der Wirbelthiere," expressly to meet their requirements. The number of English students sufficiently acquainted with German to be able to take advantage of this work in the original is unfortunately very small, but to those who could do so it has proved to be of great assistance. So well has the German edition fulfilled the object of its author, that the idea occurred to others besides Mr. Parker, that the translation of so useful a work into English was very desirable in the interests of English-speaking students, though it cannot but be a matter of regret that this should be necessary, and probably would not have been so, were English students as well acquainted with the German language as its importance demands they should be.

Throughout the work before us Mr. Parker has retained the original plan of Prof. Wiedersheim's "Grundriss," but a considerable number of additions to and modifications of the original text have been introduced. For some of these he acknowledges that he is responsible, while others have been inserted on the suggestion of Prof. Wiedersheim, who has also revised the whole work previously to its publication.

The work begins with a general introduction, in which the nature and meaning of comparative anatomy is explained, a short outline of the embryological development and structural plan of the vertebrate body is sketched out, and a table is given containing the general classification adopted by the authors throughout the work, of the principal existing vertebrate groups; there is likewise a second table from H. Credner, showing the gradual development of the Vertebrata in time. This part of the work occupies only 15 pages, and is well illustrated by means of nine woodcuts. It is preceded by a list of general works on comparative anatomy and embryology.

The comparative anatomy of vertebrates, constituting the special part of the work, and occupying 315 pages—the remainder of the book—is dealt with under nine sections, arranged according to the different organs of the body. These are treated of in the following consecutive order: integument, skeleton, muscular system, electrical organs, nervous system, organs of nutrition, organs of respiration, organs of circulation, and urino-genital organs. This part of the work is illustrated by 320 woodcuts, most of which are taken from the German edition, but some are new. After each section is appended a short bibliographical list of the more important and recent works relating to the subject under consideration in the chapter.

In treating each section the plan adopted is to begin with a few general introductory remarks, applicable to the whole of the Vertebrata, on the anatomy of the organ or set of organs to be dealt with in the section, and then to proceed to the consideration of its special characters in the different groups of vertebrates. By two kinds of type being used, one larger than the other, the more essential characters of organs or structures are readily distinguishable by the elementary student from the more theoretical and detailed information regarding them printed in the smaller type. The more important words and passages are further indicated by the use of heavy black and spaced types. The former we think might well have been dispensed with, as the use of so many kinds of types tends rather to confuse than render clear. The use of spaced type for important passages and words, though extensively used in German text-books, is only just beginning to be adopted by English authors and printers in place of italics, on which it is a very great improvement. We must, however, enter a decided protest against the use of clarendon type for any purpose except headings, on account of the blotted and disfigured appearance it gives to the pages and on account of the distraction it produces on the reader. Notes explanatory of the text are frequently added at the foot of the page throughout the whole work; that this should have been done is, we consider, a mistake. The introduction of footnotes into any work, and particularly such a work as the present, is extremely objectionable, and should be resorted to as seldom as possible except for references to other publications, where its use may be permissible. Nor is there any excuse in the present instance why so many footnotes should have been introduced, when by the use of a few lines of the smaller type in the body of the page it could have been avoided.

Throughout the text there is a want of uniformity in the manner in which the different kinds of type are used, which will probably be corrected in a new edition; thus, for example, on p. 49 the word "Snakes" is printed in spaced type, whereas three lines lower down "Lizards," another group of Reptiles, is printed in ordinary type, as are also the words "Birds" and "Mammals" on the next page. There are also some

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descriptions of structures which might be improved in another edition, so as to make the meaning clearer to the student; as an example of this, the history of the development of hair may be mentioned. The brevity of some of the descriptions is, as the authors state, to some extent made up for by the number of woodcuts, but in some cases we think it would have been well had a few lines more been added, even had it been necessary to curtail some of the small print; thus on the first page surely it would have been well to have devoted a little more space to explaining what is meant by the words "ontogeny" and "phylogeny," terms which are constantly referred to throughout the work. It is true that this is also a fault of the original German edition, but as the translator has not professed to adhere strictly to the German text this is a liberty which he might have taken.

We regret to see the words ecto-, meso-, and endoderm used by Prof. Wiedersheim in the original German changed to epi-, meso-, and hypoblast in the English edition, as we consider the terms used by German and other Continental morphologists preferable to those employed by many English writers. We also traverse the statement in the footnote, presumably Mr. Parker's, that the former terms "are applied to the corresponding layers in the adult animal." The terms are respectively synonymous when applied to vertebrates; the skeleton or muscular system of a rabbit is not spoken of as its mesoderm, but as being of mesodermic or mesoblastic origin.

In describing the homologies of the carpus and tarsus, we quite approve of the position the authors have taken with regard to a subject of much controversy on which further investigations may throw more light, but we think in the general considerations regarding the derivation of limbs from fins the history of the evolutionary changes which have taken place is stated much more definitely than the state of our knowledge justifies. That the theory with which Prof. Wiedersheim's name is connected should be brought prominently forward was to have been expected, but no reference is made to other views, such as those of Gegenbaur and Götte, which, in the uncertain state of our knowledge of the subject, might have been expected. We notice that the pentadactyle form of *Equus* found by Marsh has been omitted in the illustrations of the ancestral forms of the horse's foot, and referred to only doubtfully in the text.

In the section on organs of circulation, the heart and its vessels are excellently described, and the introduction occasionally of coloured illustrations makes the subject as clear as could be desired, but the description of the formation of the circulation in the liver and the modifications of the trunk vessels which have occurred in the evolution of the higher from the lower vertebrates, is very short and meagre.

The criticisms which we have passed, however, are not made with the view of finding fault with an excellent and creditable work, but are expressed in the hope that in future editions it may be made more useful for the purpose for which it is intended.

In conclusion, we heartily thank Mr. Parker for introducing to English students a work which we are confident will prove a great assistance to them in their studies, and by perusal of which they will be enabled to understand the anatomy of man in a much more comprehensive manner than they could from a study of human anatomy alone.

J. G. G.

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## *SCIENCE IN NORWAY*

*Nyt Magazin for Naturvidenskaberne.* "New Journal of Natural Science." (Christiania, 1886.)

THE four volumes of this admirable publication which have been sent to us by the Norwegian publishers, include the twelve numbers printed since 1882, and thus complete the third series of the magazine, which, notwithstanding its title of "New," is the oldest Norwegian publication of its kind.

The subjects treated of in its pages belong, with few exceptions, to the general natural history of Norway, in which department special attention is due to Herr Leonard Stejneger's paper on the "Ornithology of Western Norway," as well as to the various interesting contributions of Dr. Robert Collett. To the latter eminent naturalist, well known for his able work "On the Fishes of Norway" (1874), the magazine is indebted for several communications regarding the number and distribution of various species of fishes, first observed in Norway between 1879 and 1883, while in his papers on the character and species of mammals indigenous to Norway, he has contributed much useful information in reference to the Norwegian beaver (*Castor fiber*). From the author's observations, it would appear that the injury done to the forests by these animals in bringing down trees for the construction of their huts in no way justifies the indiscriminate destruction of the beaver, which had long been allowed to go on unchecked in Norway. This view has of late been so generally accepted that the Norwegian Government have been induced to appoint a close time of nine months in the year, during which the shooting or trapping of the beaver is legally prohibited. In special cases, and in certain districts, the local magistrates may even extend this period to ten years if they see reason to apprehend the extermination of the animal.

Norwegian geology and mineralogy are well represented in these volumes, Dr. Kjerulf having added to his labours of an editor those of a diligent contributor, and besides several short papers on the finer mineralogical specimens derived from the Storvarts and other important Norwegian mines—a subject which is also well treated by Herrn Olsen, Münster, and Knudsen—he has enriched the journal with interesting monographs on the local geology of the country, including notices of the dislocations observable in the Christiania valley; the character of the formations at Mjösen-lake which have been brought to light through recent railway-cuttings; and the inclination of the principal lodes on Ekersund. Dr. Hans Reusch describes at length the fall of meteors observed at Vaage in Tysne Island on May 20, 1884, giving useful tables of meteoric falls, whose dates are well attested, between 1784 and 1884. Besides various other papers, Dr. Reusch contributes some interesting geological notices of the districts of Christiania, Valders, and Viksnes, and considers at some length the evidence afforded by the fjelds of Western Norway, of the duration of the Ice age, and the local extension of glacial action in Norway.

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